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Local gender contract and adaptive capacity in small holder irrigation farming: a case study from the Kenyan drylands

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Abstract

This paper presents the local gender contract of Sibou, Kenya: a smallholder irrigation farming community. Women's role in subsistence farming in Africa has mostly been analyzed through the lens of gender division of labor. In addition to this, we used the concept of 'local gender contract' to analyze cultural and material preconditions shaping gender-specific tasks in agricultural production, and consequently, men's and women's different strategies for adapting to climate variability. We show that the introduction of cash crops, as a trigger for negotiating women's and men's roles in the agricultural production, results in a process of gender contract renegotiation, and that families engaged in cash cropping are in the process of shifting from a 'local resource contract' to a 'household income contract.' Based on our analysis we argue that a transformation of the local gender contract will have a direct impact on the community's adaptive capacity climate variability. It is therefore important to take the negotiation of local gender contracts into account in assessments of farming communities' adaptive capacity.

Keywords: local gender contract, climate variability, East African drylands, smallholder irrigation farming, gendered adaptive capacity

Introduction

Women constitute the majority of the subsistence farming workforce in Africa. In fact, while more men shift to non-farm jobs, women remain dependent on agriculture for their livelihood (Agarwal 2011). According to the Food and Agricultural Organization (FAO 2011), the proportion of women working in agriculture is still rising, and correspondingly, the dependence on food produced by women. This observation provides the basis for a 'feminization of agriculture' (Agarwal 2011). Moreover, women are faced with limited access to resources such as land, water, and extension services (FAO 2011), due to patriarchal institutions, which most often assume that the head of the household, the man, is the one in charge of agriculture (Hovorka 2006; Gladwin 2002).

This condition is directly linked with the subordinate and reproductive role given to women in the gender division of labor (Chafetz 1988). Gender division of labor is the most preponderant analytical tool employed to depict the gendered productive/reproductive divide in African agriculture, that is, that men engage with cash cropping, while women produce food crops (Bryceson 2002; Boserup 1970). In addition to this, the concept of the gender contract considers the set of power structures creating the local gender division of labor, highlighting the negotiability and the changes occurring within households' and communities' power structures (Forsberg 2010; Rantalaiho and Heiskanen 1997; Hirdman et al. 1994). Moreover, as a geographical approach, a gender contract analysis has the potential to respond to Little and Panelli's call for the emergence of new insights in the debate on gender rural geographies, by 'highlighting how negotiations (even struggles) over gender, power and space are implicated in . . . new configurations of community and work' (2003, 287).

Women's lack of agency and access to resources has been identified as one of the main causes of their vulnerability to climate change and variability (Agarwal 2011; Demetriades and Esplen 2008). Given the limited accuracy and certainty of climate change models and predictions for East Africa, where the case study is located, the term 'climate variability' was adopted for this study. This concept takes into account both singular weather events and extremes, which are part of the more complex process of climate change (IPCC 2007).

Adaptive capacity, intended as 'the ability of a system to respond to climate variability and change' (IPCC 2007, 720) is in our case study dependent on the knowledge farmers have gained by trying different strategies to manage weather unreliability. The focus of this study is on farmers' memories of extreme weather events and on the agricultural practices they adopted in those instances. This methodological approach is meant to shed light on the process of mobilizing adaptive capacity, which in turn can be used to forecast a community's reaction in similar future circumstances (Engle 2011).

The main aim of our case study of the irrigation farming community of Sibou, Kenya, was to study the negotiation of the local gender contract to understand the gender dimensions of adaptive capacity to climate variability in East African smallholder irrigation communities.

The gender contract

Gender, in this paper, is conceptualized as a structure that is embedded in society (Risman 2004). Structures, according to Giddens (1984), shape individuals' socialization and are shaped by individuals in a recursive manner. Gender has similarly been defined as a 'social institution' (Martin 2004), with both controlling and transformative effects on individuals. Along these lines, the Swedish historian Yvonne Hirdman (1990) argued that the study of power relations between men and women and the existence of gender differences and inequalities is best understood under

the lens of gender system theory. Furthermore, a gender system materializes in spatially and temporally specific contracts (Hirdman 1991). A gender contract is conceptualized as

a pattern of implicit rules on mutual roles and responsibilities, on rights and obligations, and it defines how the social relations between women and men, between the genders and generations, and also between the social production and reproduction are organized in our societies (Rantalaiho and Heiskanen 1997, 7).

Drawing from Habermas's concept of 'lifeworld,' Hirdman (1990) outlined three levels that allow for attaining an integrated social system where people share the same cultural understanding. First is the 'cultural overlay,' which is the ensemble of intellectual and metaphysical images, for example, the idea that because of biological differences women are impure. These meanings are concretized and shape power structures in two lower levels: 'social integration' (i.e. the societal gender division of labor) and 'socialization' (i.e. the division of tasks at the household level). According to Hirdman (1990), the gender system is grounded in patriarchal norms dichotomizing the roles of the sexes and consequently shaping and controlling gender structures at different levels. A gender contract analysis is concerned with illustrating such dichotomizing gender structures (Hirdman 1990). Moreover, by looking at the societal norms that regulate production and reproduction, the gender contract takes into account the group and community level, which implies that processes of knowledge exchange and formation become part of the analysis.

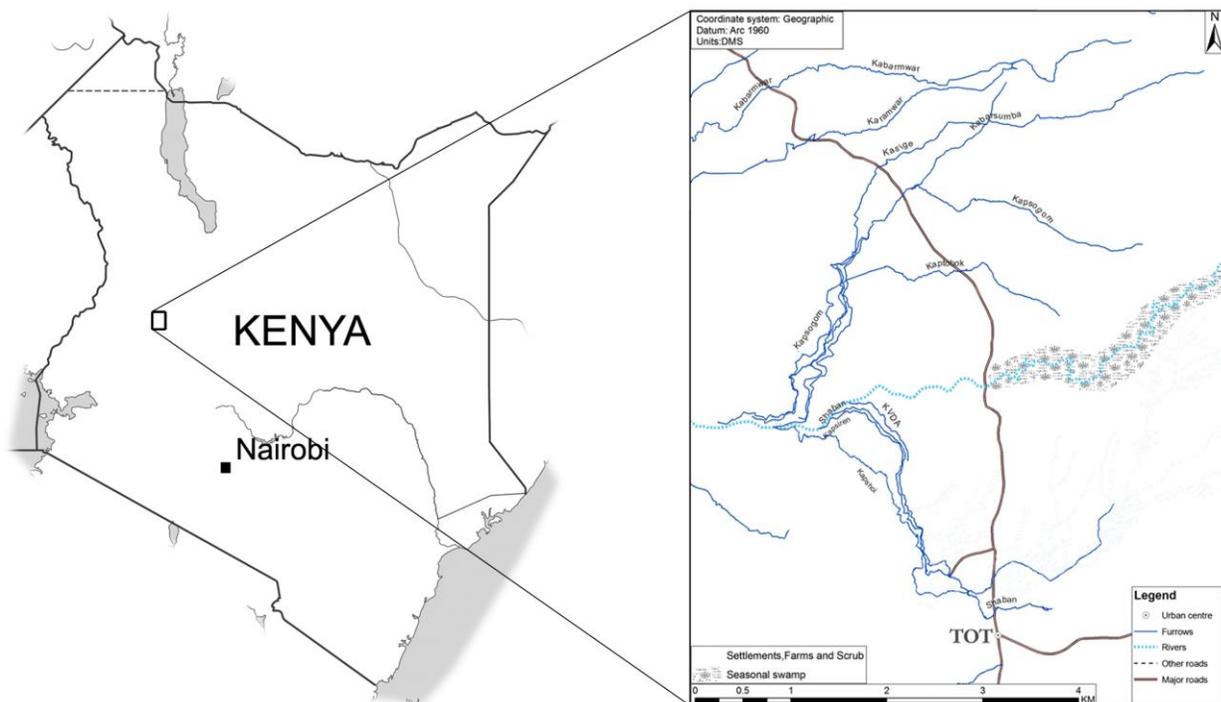
The gender contract has been used as a geographical concept to study how distinctive material conditions shape daily practices of production and reproduction in regional gender contracts in Sweden (Forsberg 2010, 1998) and housing conflicts in Southern Africa (Larsson and Schlyter 1995). In the context of agriculture in the global south, Kalabamu (2005) presented the distinct gender contract of subsistence farming communities in Botswana, characterized by

women's traditional responsibility for building housing, while Lindeborg (2012) has studied the 'rubber boom' in northern Laos and its gender spatial implications resulting from a changing gender contract. In these studies, women's task of building houses and their participation in rubber production are materially and spatially specific conditions that characterize the local gender contracts. Accordingly, geographical attentiveness avoids the risk of simplifying, encompassing, and generalizing women's situations to different contexts (Hirdman 1991).

The concept of gender contract stresses that, while power structures are most often unequal, they are not static. Instead, negotiation is embedded in everyday practice, due to changes occurring within communities (Forsberg 2010; Rantalaiho and Heiskanen 1997; Hirdman et al. 1994). This process is part of 'the pattern of implicit rules on mutual roles' (Rantalaiho and Heiskanen 1997, 7) and consequently allows for the depiction of change in gender relations. In contrast, other gender-related concepts, such as 'gender regime,' 'gender structure,' and 'doing gender,' have been criticized for providing a static portrayal of gender structures, often with women in a subordinate position (Wallach Scott 2010; Risman 2009, 2004; Deutsch 2007). However, it should be noted that the term 'negotiation' does not refer to substantial marked changes in gender power structures. It rather points to small modifications of working arrangements at the levels of socialization and social integration. It is not really until these transformations succeed in also altering the cultural overlay that the local gender contract has in effect been renegotiated into a new or different contract. An example is the transition from an agricultural to an industrial economy. At first, this shift entails new productive and reproductive arrangements between partners, when one of the two partakes in the industrial production. When such a novel household organization is shared by the majority of the community, affecting also the cultural overlay of the society, a new gender contract materializes (Forsberg 2001).

Study site: Sibou, Marakwet, Kenya

The village of Sibou, in the Endo location of Marakwet District, extends for 20.6 km² on the slopes of the Keryo Valley escarpment and is situated at an altitude between 1000 and 1600 meters above sea level. The geographical location of Sibou is also referred to as Tot, the market and administrative center established in 1949 by the colonial authority (Moore 1995). Semi-arid conditions with <1000 mm/yr rainfall and sporadic droughts characterize the environment of Keryo Valley (Songok et al. 2011). According to the 2009 national census, the population of Sibou was 2453 people, corresponding to 660 households (KNBS 2009). The settlement is located on a bowl-shaped hill, and one of its natural borders on the northern side is the Embobot River (Map 1).



Map 1. Case study location. (Adapted from Davies and Moore 2011)

Sibou's gravitational irrigation system comprises approximately 94 canals adding up to a total of 350 km (Davies and Moore 2011). This system has been tentatively dated at between 200 and 400 years old (Kodalo 2000). According to Thomson's account (1885, 310), the canals were already in operation at the end of nineteenth century.

Sibou is inhabited by the Marakwet, of the Kalenjin ethnic group. The population of Sibou is divided into four clans (patrilineal groups with common ancestors): Kapsiren, Kachepsom, Shaban, and Kapsioi. Each clan is allocated a portion from the escarpment to the valley floor and has its own intake and main canal that takes water from the Embobut River. This canal is managed by a men-only water users group that meets to build and repair furrows, and decide on water turns and rights (Östberg 2004; Adams et al. 1997) (map. 1).

Methods

Fieldwork was carried out from 2011 to 2013 over six occurrences of three months in total. Data for this article were collected during two fieldwork periods of three weeks each in June 2011 and in January 2012. During the first exploratory fieldwork, in-depth interviews were conducted with key informants: agricultural officers, local agricultural agency employees, leaders of men's and women's groups, administrative chiefs, and men and women farmers. The interviews covered broad themes, such as local culture and traditions, gender division of labor, working groups' arrangements, and irrigation techniques.

Following the first fieldwork, a four-page pictorial pamphlet in Swahili was produced to present the findings in an easily accessible way. The content focused on two themes: the local gender division of labor and the weather. In relation to the first theme, the pamphlet outlined the tasks carried out by men and women and by their specific groups. The section about the weather described climate variability and weather unreliability. During the second fieldwork, this pamphlet

was distributed to focus groups and in interviews asking for people's feedback, comments, and additions.

The pamphlet proved to be a very effective way to acquaint participants and informants with the study and the methods employed, while also stimulating reactions on the preliminary findings and making informants aware of my standpoint (Cho and Trent 2006; Baxter and Eyles 1997). Representing a feminist epistemological attempt to 'rethink how [researched] subjects are approached' (Johnson 2008, 568), this 'member checking' or 'participatory checking' improved my confidence in the interpretations and conclusions drawn (Årlin et al. in press; Cho and Trent 2006).

During the second fieldwork, eight focus groups with seven or eight participants each were conducted (Morgan 1997). This method was chosen because it allows for the natural social interactions of already existing groups to surface with their internal hierarchy and cultural codes. Moreover, focus groups facilitate the 'horizontal interview among participants' (Madriz 2000, 840), who through discussion and internal agreement validate their common experience. The sampled groups were in some cases already functioning as savings groups or irrigation management groups, or they were purposively sampled according to age and gender, for example, one group with men and one with women in their 20s or 30s, and one group with men and one with women who were over 45 years old. As an incentive for participation, as underscored by the literature (e.g. Krueger and Casey 2008), participants were given USD 0.5. This sum, discussed and agreed upon with local research assistants, corresponded roughly to two hours of agricultural wage labor, which was also the length of the discussion. Focus groups were led by the assistants in the mother tongue of participants to minimize the risk of error and misunderstandings, and to improve time effectiveness (Krueger and Casey 2008; Morgan 1997). Participants engaged with

seven themes: weather over the last three years (2009–2012) and the informants’ ranking of years according to yields obtained; crops cultivated during the last three years; timing of planting, weeding, and irrigation for each crop; weather conditions over the last three decades (1980s–2010s) and ranking of the decades according to yields obtained; extreme (good and bad) weather events in the last three decades; hour-by-hour description of an average day’s activities during harvest time; and yearly events in the community.

Answers relating to the themes were illustrated on a poster in the form of a cropping calendar (Figure 1). Focus group discussions were recorded, and with the help of assistants the recordings were transcribed at the end of every session.

A sample of 15 women and 9 men, all farmers from different age sets and clans, were selected from the focus groups. In-depth interviews with these individuals were conducted according to the methodological approach of the ‘walk along’ or ‘situated landscape interview’ (Årlin et al. in press; Carpiano 2009; Kusenbach 2003). By following the interviewee in the places of his or her daily life, for example, to a field, we could observe events and have conversations with people along the way and critically and contextually discuss crops and practices being referred to by the interviewees.

Adaptive capacity to climate variability

The weather in Sibou is characterized by two main rainy seasons: the long rainy season starting in March and continuing until June and July, and the short rainy period in October and November, sometimes followed by some rainy episodes during Christmastime. The rainy seasons punctuate the agricultural calendar and determine the activities carried out. The main farming season lasts from May to September, when all crops are cultivated.

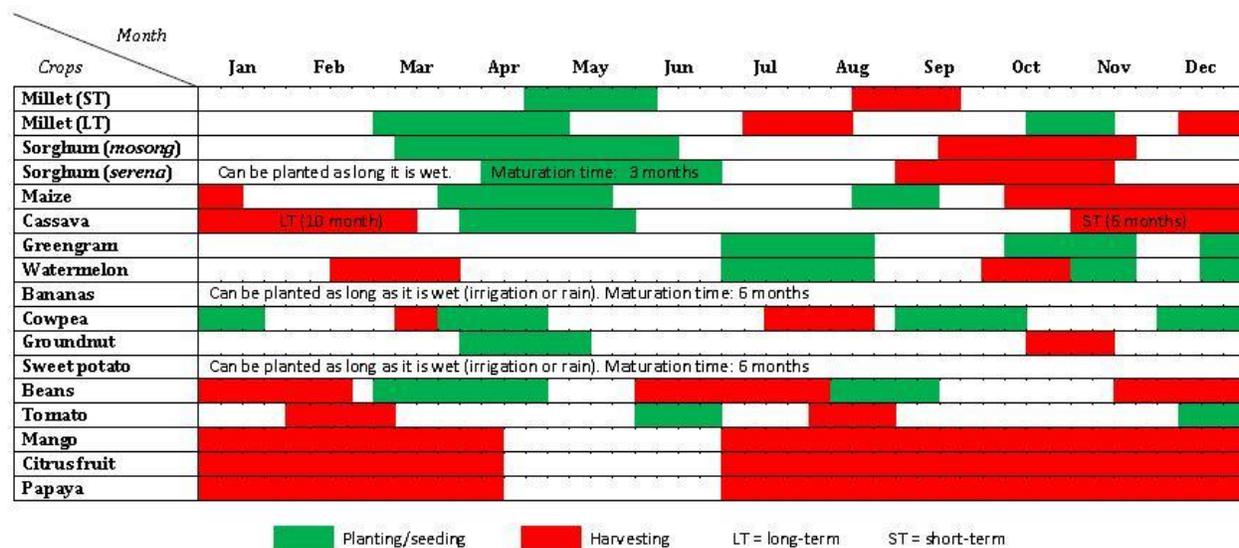


Figure 1. Cropping calendar. (Fischer 2012, 37)

Agricultural practices and timing of cultivation, irrigation, and harvesting are highly dependent on weather variability, and farmers in Sibou, as well as throughout Africa (SEI 2008), must cope with and adapt to new uncertainties in rainfall patterns as a consequence of climate change, as illustrated by the following quotations:

The rain always comes at the same time; it is the amount of rain that has changed. (Helen, 25 January 2012¹)

We know when the rain comes, but we do not know anymore how much it will be. (Lea, 6 February 2012)

Discussing variability in rainfall since the 1980s, the focus groups noted unusually good years (when they could harvest twice) and unusually bad years when they were affected by drought.

Farmers could remember good years, because the large harvests allowed them to perform both female and male circumcision, which usually takes place once in a decade. The entire village participates in these celebrations, which entail traditional dancing and sharing of food. These ceremonies can last up to a week, and are thus only possible to undertake when the harvest is

plentiful. In such rites of passage young people become officially part of a community and are given an age set name (Moore 1995).

The severe droughts of 1984 and 1993 were remembered because of food aid received from the government and international organizations. Regarding the 2009 drought, farmers reported that they could not harvest maize and that many crops failed.

Such a variable weather regime poses a challenge to farmers in Sibou. When rainfall is limited, the timeslot given to every plot to be irrigated is reduced, which can lead to the failure of part of the harvest. To avoid this, women consistently mix long- and short-term seeds of sorghum, maize, and millet:

I always use seeds of *kuptot* [short-term millet] and *kuluu* [long-term millet] together, because *kuptot* can still grow by only irrigating and be harvested first, if it does not continue to rain. If it rains enough, I can also harvest the *kuluu*, so we can fill the storage and save more seeds for the next season. (Faith, 4 February 2012)

We – elder women – tell young women to use both long- and short-term seeds, so you are always sure you will harvest something, because the weather is not reliable. (Selina, 4 February 2012)

Another strategy used by women to adapt to climate variability and to improve soil moisture and fertility is the intercropping of planting maize with beans and cowpeas.

According to men, intercropping is not used for cash crops such as green gram, groundnuts, watermelon, and tomatoes for the following reasons:

Cash crops need a big space in order to produce more and be able to sell. (Dan, 8 February 2012)

I cannot intercrop tomatoes, because they need irrigation every two weeks, which is not compatible with other crops. Also, if it rains too much, pests might develop, and then, I need to spray the plants. (Michael, 9 February 2012)

According to farmers in Sibou, the preconditions for sowing of the cash crops mentioned above are high soil moisture and heavy rains or even light drizzles following planting. After that, farmers claim, green gram and groundnuts require irrigation twice in four months. In contrast, tomato and watermelon need to be watered between two and four times per month. As a result, they grow best during a dry season after an abundant rainy season:

Watermelon takes only 62 days. Therefore, you can plant it anytime it is dry, but there must be a reliable amount of water in the canal that allows for it to be watered once a week. (John, 12 February 2012)

What the quotes above illustrate is that the adaptive capacity of family farms in Sibou is dependent on the local gender contract and how it is currently being negotiated or upheld. Families combining food and cash cropping will, for example, due to the different water requirements, have other means to adapt to climate variability than will families that depend on the common subsistence crops of the area. In families where men cultivate cash crops, the tasks related to crop management are shared between partners which, in effect means that the gender contract is being negotiated, while the traditional gender contract remains more stable in those families who have not taken up cash cropping.

Gendered adaptive capacity

In the focus groups' rankings of the last three years' weather and yields it was evident that the adaptive capacity of the community is gendered. For example, women consistently contended that 2010 was a much better year than 2011:

The second harvest of sorghum – of 2011 – went rotten because of too much rain in December. However, rain in December allowed men to plant green gram again. (Helen, 6 February 2012)

Men are only concerned with cash crops, while we – women – are in charge of bringing food to the table. If the harvest fails, who will feed the family? (Lea, 6 February 2012)

Men, however, argued the contrary:

Women are more experienced in farming, so everything that affects millet or sorghum is seen as a calamity, while we – men – look at grass for animals and cash crops for school fees.

(Nick, 8 February 2012)

Because short rains kept on coming, we could plant green gram up to three times in 2011. The rains were not as destructive as women say. (They laugh). (Jim, 8 February 2012)

These statements are clearly a rendering of the local gender contract. Moreover, men's and women's tones denote a central aspect triggering the negotiation of gender contract: conflict (Hirdman 1991). Such a confronting attitude is present also at the generational level of analysis of the gender contract. In fact, young people tend not to follow the elders' weather predictions any longer. Weather forecasting is carried out by old men in the month of January, during a ceremony where a goat is slaughtered and its intestines are observed. According to interviews with elders, and as reported by Songok et al. (2011), the appearance of the intestines helps to determine the expected amount of rain. The men who attend this ceremony pass on the message to their wives, so that women can get together and discuss what to plant. This is an example of the cultural overlay created by men to ensure the separation between sexes, and consequently, women's subordination. This is the ideal narrative of how things should be performed, while in reality:

Even though the elders say we should plant long-term seeds, we always use also the short-term ones. What if they are wrong? Do we end up with no harvest? (Violet, 9 February 2012)

We – women – go together to plant seed in fields, and depending on the soil conditions and moisture, decide which seeds to use. (Rehema, 15 June 2011)

The quotes above illustrate how the adaptive capacity of the community is structured on the local gender contract and its ongoing negotiation. While women farmers make their own decisions on cultivation, men do not object to these decisions, because they are aware of women's agricultural skills and know-how.

Negotiating the local gender contract

Agriculture is the dominant economic activity in Sibou. Earlier studies on the local division of labor in the area focused on the activities of men as builders and administrators of the system (Östberg 2004; Watson et al. 1998) and reported the subordination of women (Adams et al. 1997). Moore (1995) has in addition described the organization of household space and gender relations of the Marakwet. The theoretical approach of local gender contract provides an opportunity to merge previous understandings of gender division of labor and cultural premises. For example, the fact that women are not permitted to divert water, work on furrows, or bathe in irrigation canals illustrates how the local gender contract is integrated into the operation and maintenance of the irrigation system. The cultural taboo prohibiting women from irrigating is an expression of men's homosociality and linked to the symbolic cultural meaning that men attach to water as a way of controlling agricultural production through irrigation (cf. Sheridan 2002). This taboo is an evident manifestation of the local gender contract at the metaphysical level. Hence, while women are involved mostly with soil and crop management, men irrigate, clear out, and fence plots of land when needed (Adams et al. 1997). This gendered division of labor and gender contract was confirmed also by the present study.

The local resource contract

We define this gender contract as a ‘local resource contract,’ as it is primarily determined by the division of tasks related to soil and water management, between women and men. In this gender contract the negotiation gap (see Figure 2) is quite wide, since there is a stark difference between tasks carried out by men and women. Women are also in a subordinate position in the power hierarchy.

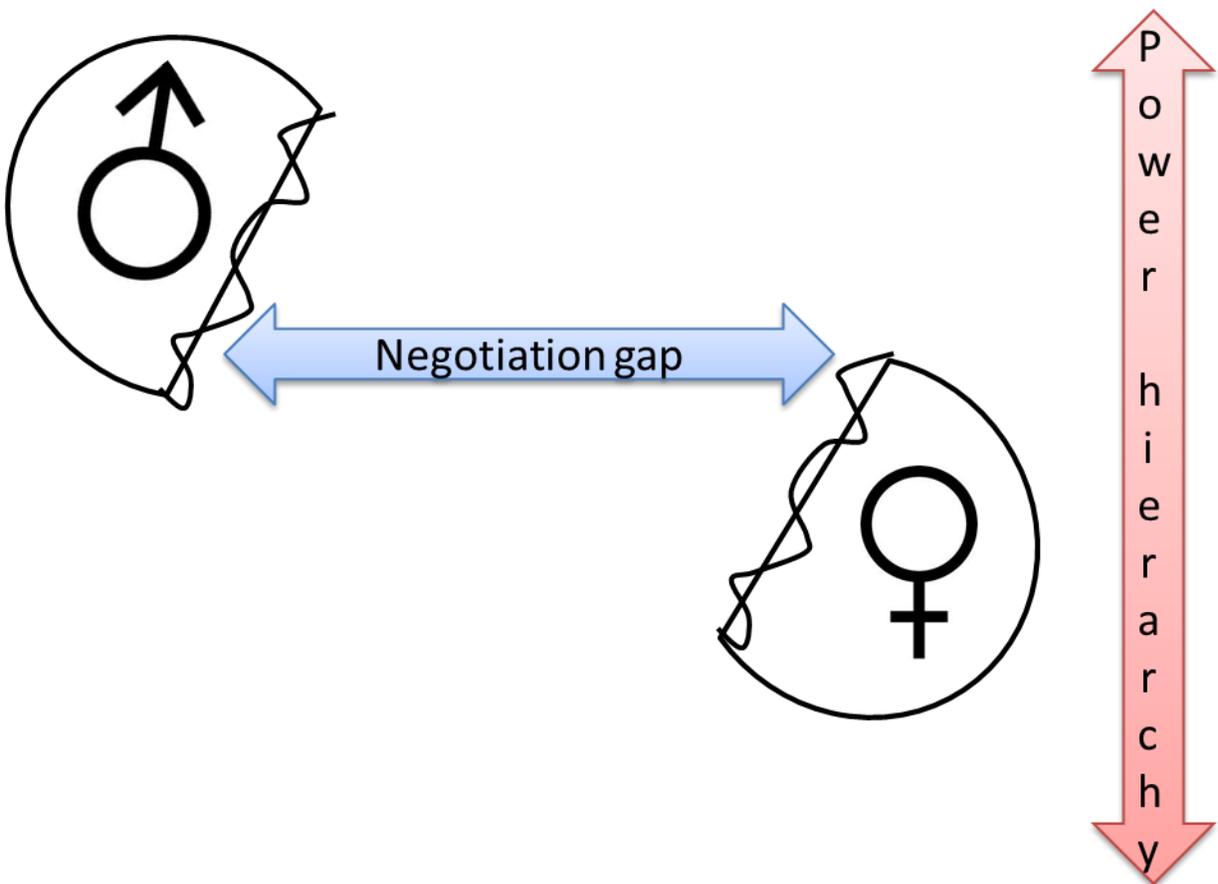


Figure2. The local resource contract. (Adapted from Forsberg 2010)

However, some younger women are breaking this taboo by washing clothes in the canals, even though they are scolded by some passersby (personal observation; Kipkorir 2012). Such behavior could be interpreted as an attempt to negotiate daily practice and the cultural overlay of the ‘local

resource contract'. But, overall this contract is clearly reflected in the local gendered division of labor. For instance, widows and single mothers need the assistance of their young sons, who are allowed to 'break the canal' as soon as they can use a hoe, or of other male relatives. The ones that cannot benefit from this help say the following:

I have to pay someone to irrigate the fields for me when my husband is not around, and I cannot get the help of any of my family members. (Alice, 3 February 2012)

I pay a neighbor 200 KSh for irrigating my fields once a month. I get that money by brewing *changa*.² (Pia, 23 January 2012)

Last year, I sold a goat to be able to pay someone to irrigate my plot. (Tina, 23 January 2012)

Fencing is also a challenge for widows and single women, as it is typically a male activity. Some women reported that they would pay someone to fence their plot because in some cases,

[n]ot having a fence means that people can enter my plot during the night or when the field is not overseen by my son, and they steal the mangoes. Last year, I lost more than half of the harvest in this way. (Kate, 24 January 2012)

Others say the following:

I do the fencing myself. In the past, it was prohibited for women to use the *rendon* [*pitchfork*]; nowadays, no one will judge you if they know you don't have a husband. (Alice, 3 February 2012)

I fence myself, and with the help of my kids, we climb the trees and harvest the mangoes. In the past, women were not allowed to climb trees, but nowadays, we do it out of necessity. (Catherine, 7 February 2012)

These last few quotations again show that the local resource contract is undergoing negotiations in relation to the gender division of labor, and how women, out of need and circumstances, may overcome patriarchal norms (see Figure 5). Several accounts and the survey carried out by Songok

et al. (2011, 76) point indeed to the mounting phenomenon of female-headed households and to the increasing amount of work performed by women. The situation is especially dire for those who cannot earn enough and therefore cannot always afford to hire someone to irrigate or fence: their crops can dry out, and the harvest can fail (cf. Hovorka 2006). To avoid this scenario, most female-headed households interviewed are involved in some sort of petty trading, ranging from selling their garden's produce at the local market to retailing secondhand clothes or soft drinks. However, this income often does not suffice, as it mostly goes towards paying school fees, which was the main preoccupation and economic challenge for most interviewees, both men and women. Such small trading and business activities are carried out by the large majority of women younger than 45 years old (see also Songok et al.'s 2011 survey), as they claim,

You cannot be completely dependent on farming. What happens if one year the weather is bad? (Lea, 6 February 2012)

You can make more money from this type of small business. This means being more independent from your spouse. (Julie, 3 February 2012)

Small trading allows me to contribute to improving the quality of life of my children. (Rehema, 3 February 2012)

The household income contract

In Sibou the gender division of labor runs along the line of crop management. While all the focus groups agreed on the importance of the main staple crops – millet, maize, short-term sorghum, and cassava – distinctions can be drawn along gender and age lines. Old women and men highlighted the importance of sweet potatoes as another staple crop, and old women mentioned long-term sorghum, which according to men is not being cultivated any longer. Young men mentioned only crops that are meant for sale, naming sweet potato last, whereas young women listed black beans, which is another main food crop. Old men mentioned only four crops in

addition to the main ones, compared to old women who mentioned 8 other crops. Both young men and young women listed watermelon. Watermelon is a pure cash crop that was introduced in the early 2000s by the Keryo Valley Development Agency and has been taken up by some young farmers since then. As in the case of mangoes, watermelons are cultivated by men, while women and young children assist with harvesting. These cash crops have radically changed the farming repertoire of Sibou, improved local livelihood conditions, and enabled many families to afford school fees.

The introduction in the last decade of cash crops triggered fundamental changes in the village; whereas the predominant narrative is that men are mainly concerned with herding, irrigation management, and field preparations, observation and interviews with younger farmers drew attention to an ongoing change in the local resource contract (see figure 5 below).

My husband cultivates tomatoes, green gram, and watermelon, and he is responsible for the mango trees. When he sells the produce to people coming from Eldoret, we can pay school fees. (Mary, 5 February 2012)

My father did not cultivate; he would fence and irrigate. Nowadays, I work together with my wife, because there is more work, as there are more crops and we can also sell some. (Dan, 8 February 2012)

Even though old people like to say that we are lazy, we work more than they did, because we have to pay school fees for our children. I can only do that by selling mangoes, green gram, and tomatoes. (Michael, 9 February 2012)

The diversification of agricultural production in Sibou has led to a negotiation of several daily practices of the local resource contract. In some families these changes can be said to constitute a shift to a different gender contract, which we identify as a ‘household income contract’ (Figure 3). Such a change has yielded both positive and negative societal consequences. While the new labor arrangement had a positive impact on the general level of school enrollment and has improved the

average family's livelihood in Sibou, some female interviewees reported an increased workload. They claimed that while earlier they were mostly concerned with cultivating food crops and doing household chores, they now also need to help in cash crop harvesting and in herding cattle too. The improved economic standard of Sibou has also resulted in the creation of three pubs and two pool places where young men gather at night. Women say that men withhold part of the profit made from selling the produce to spend on leisure activities. Drinking and playing pool, they insist, have increased violence against women and led to more separations. This phenomenon is visible near Tot's center, just below the escarpment of Sibou. Here several single mothers with children occupy or share single-room apartments without running water or electricity (see also Songok et al. 2011). These apparently contradictory outcomes underscore the centrality of the negotiation of the local gender contract at the household level.

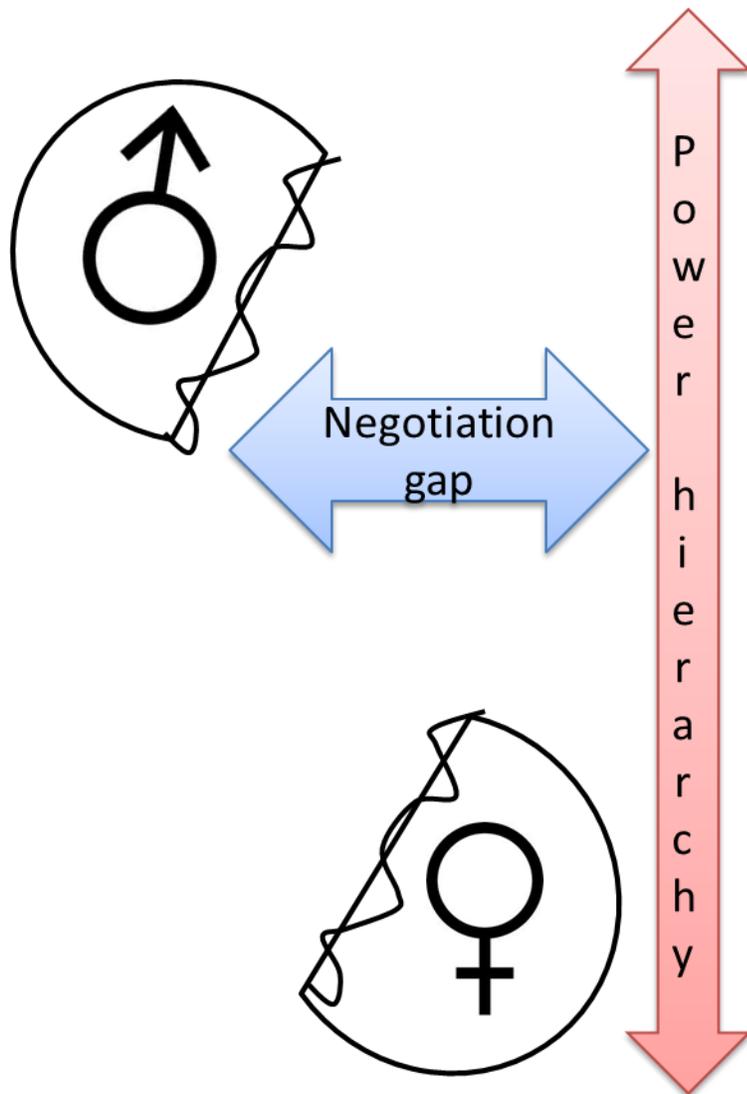


Figure 3. The household income contract.

The negotiation of the local resource contract and the emergence of a household income contract imply that spouses are sharing tasks – however, not on an equal basis. In fact, due to the dominant role of men in shaping the local gender contract, they became the natural beneficiaries of the introduction of cash crops, as they can control and use the majority of the household cash income. The introduction of cash crops also meant an increased burden of work for women, while men have in a more limited way taken up traditional women’s tasks such as crop and soil management.

Weeding and plowing of cash-cropping fields are in fact still considered mostly female activities. Hence, in the household income contract women, as well, remain in a subordinate position, and while the sharing of more tasks has reduced the negotiation gap, it has also resulted in a more imbalanced division of labor for women.

Local gender contracts and gendered communities of practice

Women can discern between six different types of millet,³ three types of cassava, four types of maize, and four types of sorghum.⁴ They store the seeds, know their characteristics, and share this knowledge among themselves. In fact, in farming communities, knowledge is not only held by individuals but also shared within groups, as reported during interviews:

When I got married, both my mom and my mother-in-law gave me their millet and sorghum seeds, so that I could start cultivating my plot. (Faith, 15 June 2011)

When we [women] work together in someone's plot, there are both young and old women. This is when the young ones learn about the seeds and are given the knowledge. (Anna, 20 June 2011)



Figure 4. Women weeding together; the 'furrow management group' repairing a canal. (Caretta 2012)

Agricultural work is also regularly carried out in groups. This arrangement, typical of East Africa (Rocheleau and Slayter 1995), constitutes a hub of labor and knowledge for both men and women. These groups are ‘communities of practice’: informal networks whose members share a common identity, rules, meetings, and communication routines (see also Andersson and Gabrielsson 2012). Such groups are the building blocks of the local gender contract, at both the community and the household level. Women reported that their mothers cooperated to accomplish planting, weeding, and harvesting, just as they themselves currently do. Several of them, for example, friends, neighbors, or relatives, get together and work in rotation on each other’s fields. This cooperation is advantageous for several reasons: work is carried out more quickly; young women have the chance to learn from older ones; and in the case of a woman who is sick, the group helps by taking care of her plot. Men, on the other hand, are members of the water management group. They get together to build and repair canals. These gendered communities of practice are crucial in facilitating the sharing of knowledge. Moreover, groups have been singled out in the literature as a key factor in shaping adaptive capacity (Pelling and High 2005).

While men are the only ones allowed to repair the canals, according to interviews, women have always assisted by carrying materials such as grass, branches, and trunks, and since the 1980s they have carried cement as well. Women are forbidden from participating in the ‘furrow management group’ meetings. Nevertheless, single mothers and widows revealed the following:

I go to the meetings, and I sit in the back. One of my relatives is member of the furrow management group. He introduces me and says, ‘This woman is alone and needs her water time,’ so I am awarded my slot to irrigate. (Selina, 31 January 2012)

My father goes to the meetings for me, and he brings the food I make. In this way I get allocated a time to irrigate. (Mary, 3 February 2012)

Male interviewees never mentioned the practice of having women carrying materials or sitting in the back during meetings. These subconscious omissions are a testimony of the predominance of the local resource contract in the community. Nevertheless, the quotations above also show how the local gender contract is mediated in everyday life: limiting practices are dodged by women, and they gain space for action to sustain their families. Such negotiation, together with fencing, picking mangoes, and herding, shows that some families have moved towards the household income contract, which is visible both at the level of social integration (e.g. the gender division of labor) and socialization (household tasks). Eventually, if the household income contract becomes the norm in Sibou and triggers an alteration of the cultural overlay, for example, allowing women to irrigate and manage cash crops, then the local gender contract will have been renegotiated into a new gender contract.

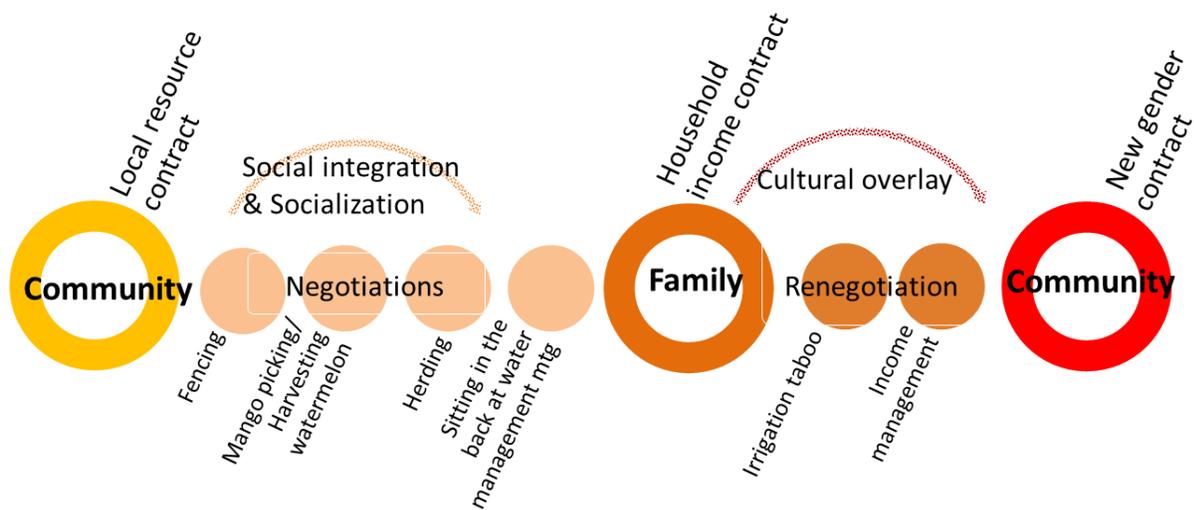


Figure 5. The negotiation process of local gender contracts.

Conclusion

This article presented the local gender contract of Sibou, a smallholder irrigation community of the Kenyan drylands in the context of an ongoing global ‘feminization of agriculture’ and adaptive capacity of smallholder farmers (Agarwal 2011).

According to Hirdman’s gender contract formation theory (1990), the metaphysical image of women’s impurity and their consequent banning from irrigation has resulted in a local specific social integration (i.e. gender division of labor). This social integration is also linked to a specific local socialization in the form of ‘direct learning’ (Hirdman 1990, 14) through gendered institutions (groups, households). Women select seeds and food crops in relation to different

climatic conditions to maintain and improve soil fertility, while men build and repair canals to manage soil erosion and distribute water efficiently.

Since the end of the 1980s men in Sibou have been increasingly producing and selling cash crops such as mangoes, green gram, watermelon, and tomatoes – all labor intensive crops. Yet, weeding and harvesting of these crops requires the concerted effort of both husband and wife and due to men's cash cropping, women have taken up men's tasks as fencing and herding. Such negotiations, whereby women challenge patriarchal norms, have reduced the negotiation gap that defines the local gender contract. A focus on the underlying cultural norms and processes of negotiation of local gender contracts may thus add analytical strength to the study of gender division of labor.

This study highlights a critical aspect in the negotiation of the local gender contract: climate variability. The increasing inclusion of men in cultivation has triggered a negotiation of the 'local resource contract' towards the 'household income contract' which has led to the present gendered adaptive capacity. Men and women make use of different strategies to counteract climate variability, for example, intercropping for women and cash cropping for men. These practices are the manifestation of men's and women's distinctive socialization - women's role as food providers for the family and men's role as head of the family responsible for cash income - and determine their different adaptive capacity. Hence, understanding how the local gender contract is negotiated and transformed provides a basis for crafting gender sensitive policies promoting adaptation and mitigation.

Finally, while it can be said that the current 'household income contract' has improved families' capacity to adapt to climate variability, it is not a more equal gender contract. In fact, women's burden in cultivation has increased, and men's control over the income has also

increased. Thus, women remain in a subordinate position, and while the sharing of more tasks has reduced the negotiation gap, it has also resulted in a more imbalanced division of labor.

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Notes

¹ While pseudonyms were used to mask the identities of the interviewees, the dates given correspond to those of the interviews.

² Local spirit brewed from millet.

³ Three types of short-term millet (between two and three months to maturity) are cultivated – *kuptuganis*, *kuptot*, and *America* (the last seed was so named because it was sent as relief aid during a famine in the 1980s). People's scattered memories and local agricultural records seem to indicate 1976 as the year of introduction of the other short-term types. Three types of long-term millet (approximately four months to maturity) cultivated are *kuluu*, *cherongo*, and *kumuino*.

⁴ People mentioned long-term sorghum as a single type, while there are different varieties of short-term sorghum called *Serena*, *Queen* and *Sereto* (named in order of adoption, from the mid-1980s onwards). *Serena* is reportedly the most commonly used.

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